

What is claimed is:

## CLAIMS

### DEVICE FOR USE IN COMMUNICATION SYSTEMS

1. A device that receives and processes signals from a telephone line and supports a plurality of telephone signal protocols, comprising:
  - a converter circuit that digitizes input signals received on the telephone line; and
  - a digital filter circuit that filters the digitized input signals to separate signals associated with different protocols.
2. A telephony device that receives signals from and transmits signals to a telephone line, the device comprising:
  - a single data transmit, data receipt, analog signal path, coupled to the telephone line;
  - wherein the device supports multiple different telephone signal protocols through the single data transmit, data receipt, analog signal path.
3. The telephony device claimed in claim 2 further comprising an isolation barrier circuit, an analog front-end circuit, a digital-to-analog converter and an analog-to-digital converter, coupled to the analog signal path.
4. The telephony device claimed in claim 3 wherein the analog front-end circuit is coupled directly to the telephone line, and wherein the analog-to-digital converter and the digital-to-analog converter are coupled between the analog front-end circuit and the isolation circuit.
5. The telephony device claimed in claim 3 further including digital filter circuits.

6. The telephony device claimed in claim 5 wherein the device performs fixed sample rate conversion and variable sample rate filtering.

7. A telephony device that processes signals received on a telephone line for supporting multiple different telephone line signal protocols, the device comprising:  
a digitizer, coupled to the telephone line, that digitizes at least two of the multiple input signals received on the telephone line.

8. The device of claim 7 wherein the digitizer comprises a digitizer circuit that digitizes all of the input signals received on the telephone line.

9. A device that receives and processes signals from a communication link and supports a plurality of signal protocols, comprising:  
a digital filter that receives a single sampled data stream;  
wherein the device supports the at least two of the plurality of signal protocols through the digital filter.

10. A device that processes signals received on a communication link for supporting a plurality of signal protocols, the device comprising:  
a digital filter, coupled to the communication link, that receives a single sampled data stream, and outputs at least two separate sampled data streams each having an association with a respective one of at least two of the plurality of signal protocols.

11. The device of claim 10 wherein the single sampled data stream is representative of at least two components each having an association with a respective one of the at least two of the plurality of signal protocols.

12. A device that receives and processes signals from a communication link and supports a plurality of signal protocols, comprising:  
a converter, coupled to the communication link to receive a single analog input signal;

wherein the device supports at least two of the plurality of signal protocols through the converter.

13. The device of claim 12 wherein the converter comprises a single analog to digital converter.

~~14.~~ A device that processes signals received on a communication link for supporting a plurality of signal protocols, the device comprising:

a converter, coupled to the communication link, that outputs a single sampled data stream that is representative of at least two components each having an association with a respective one of at least two of the plurality of signal protocols.

15. The device of claim 14 wherein the converter comprises an analog to digital converter circuit.

16. The device of claim 14 wherein the a converter receives an analog signal having at least two components each associated with a respective one of the at least two of the plurality of signal protocols.

17. The device of claim 16 wherein the converter comprises an analog to digital converter circuit.

~~18.~~ A device that receives and processes signals from a communication link and supports a plurality of signal protocols, comprising:

a converter, coupled to the communication link, that receives an analog input signal indicative of a signal on the communication link and outputs a sampled data stream representative of the analog input signal; and

a digital filter that receives the digital signal and outputs at least two separate digital signals each having an association with a respective one of at least two of the plurality of signal protocols.

19. The device of claim 18 wherein the analog input signal is indicative of a received signal on the communication link.

20. The device of claim 18 wherein the signal on the communication link comprises at least two components each having an association with a respective one of the at least two of the plurality of signal protocols, and the digital signal output by the converter comprises a single digital signal that is representative of the at least two components.

21. The device of claim 18 wherein the converter comprises an analog to digital converter circuit.

22. The device of claim 18 wherein the digital filter comprises at least two digital filters, a first one of the digital filters outputs a first one of the at least two separate digital signals, and a second one of the digital filters output a second one of the at least two separate digital signals.

23. The device of claim 19 wherein the first one of the digital filters comprises a type of digital filter selected from a group consisting of POTS, ADSL and IDSN, and the second one of the digital filters comprises a type of digital filter selected from a group consisting of POTS, ADSL and IDSN, and a different type than the type of the first digital filter.

24. The device of claim 19 wherein the first one of the digital filters comprises a first bandwidth characteristic and the second one of the digital filters comprises second bandwidth characteristic different than the first bandwidth characteristic.

25. The device of claim 19 wherein the first one of the digital filters comprises a low pass filter, and the second one of the digital filters comprises a high pass filter.

26. The device of claim 19 wherein the first one of the at least two of the plurality of signal protocols occupies a first bandwidth and the second one of the at least two of the

plurality of signal protocols occupies a second bandwidth that does not overlap the first bandwidth.

27. The device of claim 19 wherein the digital filter comprises a digital filter circuit.

28. The device of claim 14 wherein the digital filter includes at least two sample rate converters.

29. The device of claim 14 wherein the digital filter includes at least two decimation digital filters and at least two interpolation digital filters, each of the at least two decimation digital filters having an association with a respective one of at least two of the plurality of signal protocols, and each of the at least two interpolation digital filters having an association with a respective one of the at least two of the plurality of signal protocols.

30. The device of claim 29 wherein each of the two decimation digital filters and each of the two interpolation digital filters comprises a sample rate converter.

~~31.~~ A device that receives and processes signals from a communication link that supports a plurality of signal protocols, comprising:

a converter, coupled to the communication link, that outputs a sampled data stream; and

a digital filter that filters the sampled data stream to separate signals associated with different signal protocols.

~~32.~~ A device that receives a first input sampled data stream and a second input sampled data stream, the first input sampled data stream being representative of a signal associated with a first signal protocol, the second input sampled data stream being representative of a signal associated with a second signal protocol, and generates an output data stream in response at least to the first input sampled data stream and the second input data stream.

33. The device of claim 32 wherein the device is coupled to a communication link that supports the first signal protocol and the second signal protocol.

34. The device of claim 32 wherein the first input sample data stream is representative of a signal associated with a first signal to be transmitted and associated with a first signal protocol, and the second input sample data stream is representative of a signal associated with a second signal to be transmitted and associated with a second signal protocol.

35. The device of claim 33 wherein the first input sample data stream is representative of a signal associated with a first signal to be transmitted and associated with a first signal protocol, and the second input sample data stream is representative of a signal associated with a second signal to be transmitted and associated with a second signal protocol.